DOCUMENT RESUME

ED 060 096 TM 001 254

TITLE	Furniture Upholsterer 780.381 -- Technical Report on Standardization of the General Aptitude Test Battery.
INSTITUTION	Manpower Administration (DOL), Washington, D.C. U.S. Training and Employment Service.
REPORT NO	NJSES-TR-S-57
PUB DATE	Aug 54
NOTE	15p.
EDRS PRICE	MF-$0.65 HC-$3.29
DESCRIPTORS	*Aptitude Tests; *Cutting Scores; Evaluation Criteria; *Furniture Industry; Job Applicants; *Job Skills; Norms; Occupational Guidance; *Personnel Evaluation; Test Reliability; Test Validity
IDENTIFIERS	Furniture Upholsterer; GATB; *General Aptitude Test Battery

ABSTRACT

The United States Training and Employment Service General Aptitude Test Battery (GATB), first published in 1947, has been included in a continuing program of research to validate the tests against success in many different occupations. The GATB consists of 12 tests which measure nine aptitudes: General Learning Ability; Verbal Aptitude; Numerical Aptitude; Spatial Aptitude; Form Perception; Clerical Perception; Motor Coordination; Finger Dexterity; and Manual Dexterity. The aptitude scores are standard scores with 100 as the average for the general working population, and a standard deviation of 20. Occupational norms are established in terms of minimum qualifying scores for each of the significant aptitude measures which, when combined, predict job performance. Cutting scores are set only for those aptitudes which aid in predicting the performance of the job duties of the experimental sample. The GATB norms described are appropriate only for jobs with content similar to that shown in the job description presented in this report. A description of the validation sample is included. (AG)

ED 060096

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TECHNICAL REPORT

ON

STANDARDIZATION OF THE GENERAL APTITUDE TEST BATTERY

FOR

FURNITURE UPHOLSTERER, 780.381

S-57

LL 254

U. S. Employment Service in
Cooperation with
New Jersey and Tennessee State Employment Services

U. S. DEPARTMENT OF LABOR

Washington , D. C.
August 1954

GATB #2028C, 2009 and 2025
Fall 1953

STANDARDIZATION OF THE GENERAL APTITUDE TEST BATTERY
FOR
Furniture Upholsterer 780.381

S-57

Summary

The General Aptitude Test Battery, B-1002A, was administered to two samples of Upholsterers. The Validation Sample includes forty (40) men and nine (9) women employed in the upholstering department of Diamond Brothers Company, Trenton, New Jersey. Linear values assigned to rank order supervisory ratings based on quantity and quality of work were used as the criterion for this sample.

The Cross Validation Sample includes thirty-four (34) male and seven (7) female upholsterers employed by the Cleveland Chair Company, Cleveland, Tennessee. The following criteria were used in this study: supervisory ratings, average hourly earnings over a three month period, and production ratio earnings.

On the basis of statistical results of the combined study as well as the statistical results of each experimental sample analyzed separately, and the job analysis data, the following aptitudes were found to be significant: (S) Spatial Aptitude, (K) Motor Coordination, (F) Finger Dexterity, and (M) Manual Dexterity.

GATB Norms for Furniture Upholsterer 780.381 S-57

Table I shows, for B-1001 and B-1002, the minimum acceptable score for each aptitude included in the test norms for Furniture Upholsterer 780.381

TABLE I

Minimum Acceptable Scores on B-1001 and B-1002 for or S-57

B-1001			B-1002		
Aptitude	Tests	Minimum Acceptable Aptitude Score	Aptitude	Tests	Minimum Acceptable Aptitude Score
S	CB-1-H CB-1-F	85	S	Part 3	80
T	CB-1-G CB-1-K	70	K	Part 8	75
F	CB-1-O CB-1-P	80	F	Part 11 Part 12	75
M	CB-1-M CB-1-N	90	M	Part 9 Part 10	85

Effectiveness of Norms

The data in Table IV-C indicate that 21 of the 30 poor workers, or 70% of them, did not achieve the minimum scores established as cutting scores on the recommended test norms. This shows that 70% of the poor workers would not have been hired if the recommended test norms had been used in the selection process. Moreover, 46 of the 55 workers who made qualifying test scores, or 84%, were good workers.

TECHNICAL REPORT

I. Problem

This study was conducted to determine the best combination of aptitudes and minimum scores to be used as norms on the General Aptitude Test Battery for the occupation of Furniture Upholsterer 780.381.

II. Sample

This study is based on two samples of workers engaged in the occupation of Furniture Upholsterer. Both samples were tested with the B-1002A edition of the GATB.

A. Validation Sample

The Validation Sample consisted of 41 men and 9 women employed in the Upholstering Department of Diamond Brothers Company, Trenton, New Jersey. This number represented the total plant population in this occupation with the exception of some 15 additional workers, who, because of language difficulties or insufficient experience, were not included in the experimental sample. One male worker was eliminated from the sample when it was discovered that he had only four years of education and that lack of education was affecting his performance on the cognitive tests. The final sample, therefore, consisted of 40 men and 9 women.

The job of Upholsterer at the Diamond Brothers Company is performed on an assembly line basis, each worker performing a designated portion of the upholstering of chairs, davenports, studio couches, etc. Women are used mainly on the finishing operations which do not require lifting of heavy and cumbersome pieces. Training time is considered to be from 1 to 3 months, depending upon the individual and the specific tasks assigned.

Selection of applicants for these jobs is based upon an interview only. There are no experience or educational requirements, but older workers are rarely utilized. Age requirements are 16 to 45 years, with a marked preference for younger workers.

B. Cross Validation Sample

The Cross Validation Sample consisted of 34 male and 7 female employees of the Cleveland Chair Company, Cleveland, Tennessee. The GATB was administered to this group during July 1953. Although the potential sample included 82 workers, 41 of them were eliminated from the group because of being outside the age or education limitations to which the company adhered for this study.

Tables II-A and II-B show the means, standard deviations, ranges, Pearson product-moment correlations with the criteria, and the standard errors of correlation for age, education and experience for the Validation Sample and Cross Validation Sample, respectively. Table II-C shows the means, standard deviations and ranges for age, education and experience for the combined sample.

TABLE II-A

Means (M), Standard Deviations (σ), Ranges, Pearson Product-Moment Correlations with the Criterion (r), and the Standard Errors of Correlation (σ_r) for Age, Education, and Experience

Furniture Upholsterer 780.381

Validation Sample
N = 49

	M	σ	Range	r	σ_r
Age (years)	25.6	7.6	16-48	.099	.141
Education (years)	9.4	1.9	6-12	-.022	.143
Experience (months)	18.7	16.0	1-69	.311*	.129

*Significant at the .05 level

TABLE II-B

Means (M), Standard Deviations (σ), Ranges, Pearson Product-Moment Correlations with the Criteria of Supervisory Ratings (r_1), Average Hourly Earnings (r_2), Production Ratio Earnings (r_3), and the Standard Errors of Correlations (σ_{r_1}), (σ_{r_2}), (σ_{r_3}) for Age, Education, and Experience

Furniture Upholsterer 780.381

Cross Validation Sample
N = 41

	M	σ	Range	r_1	σ_{r_1}	r_2	σ_{r_2}	r_3	σ_{r_3}
Age (Yrs.)	27.7	6.7	17-44	.366*	.135	.145	.153	.081	.155
Educ. (Yrs.)	7.8	1.6	5-12	-.037	.156	-.100	.154	-.084	.155
Co. Exp. (Mos.)	37.3	30.0	4-120	.719**	.075	.549**	.109	.285	.143
Total Exp. (Mos.)	47.5	41.9	4-180	.617**	.097	.376*	.134	.080	.155

** Significant at the .01 level
* Significant at the .05 level

TABLE II-C

Means (M), Standard Deviations (σ) and Ranges for Age, Education and Experience

Furniture Upholsterer 780.381

Combined Sample
N = 90

	M	σ	Range
Age (years)	26.6	7.2	16-48
Education (years)	8.7	1.9	5-12
Experience (months)	27.2	25.2	1-120

The data in Table II-A indicate that there is no significant correlation between age or education and the criterion, but a correlation significant at the .05 level exists between experience and the criterion for the Validation Sample. Since subjective ratings were used as the criterion for this sample, it was not feasible to correct the criterion statistically to nullify the influence of experience.

Table II-B shows a correlation significant at the .05 level between age and the criterion of supervisory ratings. The correlations between experience and the criterion of supervisory ratings and of average hourly earnings are significant at the .01 level.

The significant correlations between experience and the criterion of supervisory ratings probably reflect the bias of the supervisor in favor of those who had been on the job for the longest period of time. The relationship between experience and the criterion of average hourly earnings was plotted. It was found that the significant correlation between these two variables reflected a few extreme cases, therefore, it did not seem feasible to correct the criterion statistically to nullify the influence of experience.

The two samples appear to be similar to each other with respect to age and education.

III. Job Description

Job Title: Furniture Upholsterer 780.381

Job Summary: Upholsters wood furniture by assembling, fitting, and securing spring assemblies, cotton padding, covering materials, and leg units to prefabricated furniture frames.

Work Performed:

Performs one or more of the following tasks in the upholstering of furniture. (Note: Women perform only those operations which do not require heavy lifting. The various tasks of the job are generally equivalent with respect to aptitude requirements.)

Installs springs. Fastens cone-shaped springs into seats and no-sag springs into backs of wooden frames by nailing spring clips on frame, hooking springs into clips and clinching clip on spring, using hammer and clinching tool. Assembles various sections of no-sag springs and clinches them together. Covers back springs with burlap and tacks burlap to frame.

Pads and covers seat. Covers seat springs with sisal padding and then with burlap. Tacks burlap to frame. Sews a roll of padding (edge roll) along front edge of springs, using a curved upholsterer's needle, and places a layer of cotton padding over springs. Fits outer seat covering, which has been cut and sewed to size, over seat, drawing and pulling it smoothly and firmly over top and front of seat, and tacks it to the frame.

Pads and covers top and inside of arms. Folds cotton to proper thickness and tacks to top and inner side of arms. Fits finish covering material over top and inner side of arm, drawing it securely in place and tacks it to frame. Adds additional padding under covering as necessary.

Pads and covers inside portion of backs of furniture. Tacks sisal pad to back, over springs. Places cotton padding over top edge of back and fills in rest of back with several layers of cotton. Fits finish covering material over back, drawing and pulling it in securely at seat and around arms, and fastens it to frame with tacks. May cut material at times with scissors to fit it properly around arms. Uses end of scissors to smooth and distribute surplus material over corners into pleats.

Pads and covers outside of arms. Places cardboard covering over outside surface of arm and tacks it to frame. Fits outside covering material which is already padded, to outside of arm, adding cotton padding where necessary and tacks covering to frame. Cuts material as necessary to fit it smoothly around legs.

Finishes upholstering and secures leg units. Places furniture piece on plant floor with outside back facing up. Tacks top edge of outside back cover at several points to top back rail to hold cover in position. Aligns a strip of cardboard to top edge of top back rail and directly over edge of outside back cover. Secures cardboard by tacking to top back rail. Pulls covering down over top edge of cardboard to secure a straight line edge. Secures covering by tacking taut to underside of bottom rail, beginning at center of rail to prevent wrinkles and to keep covering straight. Folds under, by hand, any excess covering material at sides, keeping edges of covering in alignment with outside edge of back rails. Holds covering in position temporarily by tacking sides to back rails. Secures covering by sewing edges to adjoining inside back and outside arm coverings, using an upholsterer's needle. Removes tacks along sides by prying with a screw driver. Turns furniture piece over to rest on arms with bottom side up. Cuts a piece of bottom covering material from supply roll with hand shears. Tacks bottom covering to all bottom rails to enclose bottom area. Drives wooden dowels into pre-drilled holes in bottom of frame at leg points, with a hand hammer. Drives prefabricated legs onto dowels with a hand hammer. Secures each leg to frame with three Philipps head screws using an electric powered screw driver. Hammers metal skids into bottom of legs to permit easy sliding of furniture piece over floor surfaces.

Tufts buttons: Positions template over portion of chair to be tufted; inserts chalk in holes of template to mark location of the buttons; threads mattress needle with tufting cord and attaches button to cord; pushes needle through chair at points marked by chalk and pulls cord taut, causing the button to be flush with chair covering; ties cord securely on reverse side of chair, holding button in place.

IV. Experimental Battery

All of the parts of the General Aptitude Test Battery, B-1002A, were administered to the Validation and Cross Validation Samples.

V. Criterion

A. Validation Sample - New Jersey

The criterion for the Validation Sample consisted of rank order supervisory ratings.

First line supervision over all the workers is exercised by the General Foreman. The Plant Manager, to whom the General Foreman is directly responsible, is also fully cognizant of the performance of all the workers. Although piece work rates govern earnings of the workers, rates vary according to the operation performed and offer no single objective comparison for the total sample. Therefore, it was decided to secure independent rank order ratings from both supervisors based on quantity and quality of work. Linear values were assigned to the ratings and a product-moment correlation was computed. The correlation between the two independent ratings was .895 with a standard error of .028. At first it was decided to use the ratings of the General Foreman for criterion purposes since, because of his closer association with the workers, he should be in the better position to evaluate their relative performance. As a further check, however, the two supervisors were asked to make a joint rating of the workers three weeks after each had made his original ratings, without consulting the original ratings. The correlation between the original ratings of the General Foreman and those assigned at the conference was .980 with a standard error of .006. The original ratings of the Plant Manager showed a correlation of .867 with a standard error of .035 with the conference ratings. In view of these high correlations, the ratings assigned at the conference between the two supervisors were used as the criterion.

B. Cross Validation Sample - Tennessee

The criterion for the Cross Validation Sample consisted of (1) supervisory ratings, (2) average hourly earnings based on a three-month period, and (3) a production-ratio type criterion.

(1) Supervisory Ratings

The supervisory ratings were made by the general foreman who distributed the work, gave needed instructions, and did the trouble shooting for the more difficult problems of the workers. Because of his length and breadth of experience in the plant, he was the only person qualified to rate each worker. This task was difficult due to the variety of tasks performed by the workers. However, each of the workers had done a sufficient variety of work to be qualified to do a complete upholstering job on any chair, with the exception of the female workers who did not work on the larger chairs because of the weight involved.

(2) Average Hourly Earnings

The average hourly earnings over a three-month period were based on a piece rate scheme according to the type of work done. There are three production lines, one for large-base, one for small-base and one for pull-up chairs. The workers on the small-base and pull-up chairs do the complete upholstering jobs on these chairs. Of the 41 tested, 11 worked on small-base chairs and 7 (all of the women in the sample) upholstered the pull-up, a lighter weight chair. In the large-base section, however, 9 workers did the complete upholstering job while the other part of the section operated on the assembly line principle with 5 workers doing the outside arms and outside backs; 5 doing the inside arms; 3 doing the inside backs; and 1 doing the seats. Although a tendency existed to put the better workers on the higher priced jobs, there is clearly no one-to-one relationship between these hourly earnings and some more nearly ideal measure of proficiency that is comparable for all workers.

(3) Production-Ratio Earnings

This criterion was derived from the average hourly earnings in an attempt to make the ratings more nearly comparable by having each worker compared only with the others of his sub-group doing the same kind of work over the three-month period. The measure of each person is the ratio of his earnings to the average earnings of his group. (The 3 workers on the inside backs and the 1 worker upholstering the seats were combined into one sub-group for these purposes.) A shortcoming of this criterion is that the reliability would not be as high as desirable because of the expected instability of the sub-group means used in computing the ratios, due to the small sizes of the groups.

The following table shows the intercorrelations of the criteria consisting of supervisory ratings, average hourly earnings and the production-ratio earnings.

	Supervisory Ratings	Average Hourly Earnings
Average Hourly Earnings	.684	
Production-Ratio Earnings	.394	.642

Substantial agreement was obtained between average hourly earnings and supervisory ratings as well as between average hourly earnings and production ratio earnings. The degree of agreement obtained between supervisory ratings and average hourly earnings is not unexpected because both are based on over-all job performance. The substantial agreement obtained between average hourly earnings and production ratio earnings is not surprising because one of these criteria is derived from the other. Higher agreement between these two criteria was not obtained probably because average hourly earnings are based on overall performance whereas production ratio earnings are based only on performance of specific phases of the job. Only moderate agreement was obtained between supervisory ratings and production ratio earnings. This might be attributed in part to the fact that the supervisory ratings are based on overall performance in comparison with all other workers in the sample, whereas the production ratio earnings are based on performance of specific phases of the total job relative to the performance of particular sub-groups of the sample.

VI. Statistical and Qualitative Analysis

Both samples of Upholsterers perform similar job duties. Examination of available data has shown that the two samples are sufficiently similar with respect to age, education and aptitude level to warrant combining the data, whenever statistically feasible. Therefore, data for the samples have been analyzed separately and in combination on the basis of both statistical and qualitative considerations. Means, standard deviations, and correlations with the criterion were calculated for the aptitude scores for each sample separately. Means and standard deviations were calculated for the combined sample.

Tables III-A and III-B show the means, standard deviations, Pearson product-moment correlations with the criteria and standard errors of correlations for the Validation and Cross Validation Samples, respectively. Table III-C shows the means and standard deviations for the aptitudes of the GATB for the combined sample.

The means and standard deviations of the aptitudes are comparable to general population norms with a mean of 100 and a standard deviation of 20.

TABLE III-A

Means (M), Standard Deviations (σ), Pearson Product-Moment Correlations with the Criterion (r), and the Standard Errors of Correlation (σ_r) for the Aptitudes of the GATB

Furniture Upholsterer 780.381

Validation Sample
N = 49

Aptitudes	M	σ	r	σ_r
G-Intelligence	87.898	15.162	.242	.134
V-Verbal Aptitude	85.673	13.637	-.045	.143
N-Numerical Aptitude	84.959	19.070	.147	.140
S-Spatial Aptitude	96.653	17.183	.431**	.116
P-Form Perception	93.184	18.414	.251	.134
Q-Clerical Perception	92.286	16.234	.302*	.130
K-Motor Coordination	97.469	19.191	.080	.142
F-Finger Dexterity	107.163	19.852	.183	.138
M-Manual Dexterity	105.449	18.941	.317*	.129

** Significant at the .01 level
* Significant at the .05 level

TABLE III-B

Means (M), Standard Deviations (σ), Pearson Product-Moment Correlations with the Criteria of Supervisory Ratings (r_1), Average Hourly Earnings (r_2), Production Ratio Earnings (r_3), and the Standard Errors of Correlations (σ_{r_1}), (σ_{r_2}), (σ_{r_3}) for the Aptitudes of the GATB

Furniture Upholsterer 780.381

Cross Validation Sample
N = 41

Aptitudes	M	σ	r_1	σ_{r_1}	r_2	σ_{r_2}	r_3	σ_{r_3}
G-Intelligence	85.976	12.619	.044	.156	.230	.148	.145	.153
V-Verbal Aptitude	82.415	11.382	.131	.153	.164	.152	-.008	.156
N-Numerical Aptitude	83.390	15.765	.060	.156	.227	.148	.222	.148
S-Spatial Aptitude	90.293	13.832	-.088	.155	.152	.153	.084	.155
P-Form Perception	89.341	16.142	-.118	.154	.107	.154	.321*	.140
Q-Clerical Perception	87.195	10.942	-.176	.151	.012	.156	.272	.145
K-Motor Coordination	91.171	19.052	.312*	.141	.197	.150	.310*	.141
F-Finger Dexterity	90.293	15.742	.007	.156	.241	.148	.226	.148
M-Manual Dexterity	104.049	16.705	.352*	.137	.364*	.135	.407**	.130

** Significant at the .01 level
* Significant at the .05 level

TABLE III-C

Means (M) and Standard Deviations (σ) for the Aptitudes of the GATB

Furniture Upholsterer 780.381

Combined Sample
N = 90

Aptitudes	M	σ
G-Intelligence	87.0	14.1
V-Verbal Aptitude	84.2	12.8
N-Numerical Aptitude	84.2	17.7
S-Spatial Aptitude	93.8	16.1
P-Form Perception	91.4	17.5
Q-Clerical Perception	90.0	14.3
K-Motor Coordination	94.6	19.4
F-Finger Dexterity	99.5	20.0
M-Manual Dexterity	104.8	18.0

The statistical results were interpreted in the light of the job analysis data. The job analysis data indicated that the following aptitudes measured by the GATB appeared to be important for the occupation of Upholsterer:

Aptitude S - Spatial Aptitude is required in order to visualize a completed furniture piece when positioning and fitting spring assembly units and padding.

Aptitude K - Motor Coordination is required in order to tack quickly and accurately cardboard, padding and covering material to correct points of the frame.

Aptitude F - Finger Dexterity is required in threading and using upholstery needles, in fitting and folding upholstery coverings, and in using tacks.

Aptitude M - Manual Dexterity is required in using hand tools, in handling and assembling spring units, in building up and securing padding, and in handling, positioning, and securing covering materials.

Aptitude P - Form Perception is required to some extent in examining upholstery covering to assure that pattern is correct and that color is consistent.

The aptitude profiles of the Validation Sample and the Cross Validation Sample are similar with respect to the aptitudes indicated as significant in the job analysis. The mean scores of the Validation Sample are slightly higher than those of the Cross Validation Sample.

In Table III-A, which presents data for the Validation Sample, Aptitude S shows significant correlation at the .01 level and Aptitudes Q and M show significant correlation at the .05 level with the criterion of supervisory ratings.

The data for the Cross Validation Sample, which appear in Table IV-B, show that Aptitudes K and M correlate significantly at the .05 level with the criterion of supervisory ratings. Aptitude M shows significant correlation at the .05 level with the criterion of average hourly earnings. Aptitude M also shows a significant correlation at the .01 level, and Aptitudes P and K at the .05 level, with the criterion of production-ratio earnings.

The data in Table III-C show that Aptitudes S, K, F and M have the highest mean scores for the combined sample. All of the aptitudes have standard deviations of less than 20.

On the basis of all the foregoing considerations, including both quantitative and qualitative factors, Aptitudes S, K, F and M were chosen for inclusion in the test norms. Each of these aptitudes was found to be significant on the basis of job analysis data. In addition, Aptitude M was included in the test norms on the basis of its high mean score and significant correlations with the criteria of both the Validation and Cross Validation Samples. The inclusion of Aptitude S in the test norms is warranted statistically on the basis of showing a high mean score for the combined sample and a significant correlation at the .01 level with the criterion of the Validation Sample. Statistical data which

support the inclusion of Aptitude K are a high mean score and correlations significant at the .05 level with the criteria of supervisory ratings and production-ratio earnings for the Cross Validation Sample. Although Aptitude F did not exhibit significant correlations with the criteria of the Validation or Cross Validation Sample, it was included in the test norms on the basis of its high mean score as well as importance as indicated in the job analysis.

Although Aptitude Q showed a significant correlation at the .05 level with the criterion of the Validation Sample, it did not show a high mean score and there was no evidence of its importance apparent in the job description. Therefore, Aptitude Q was not included in the test norms. The statistical and qualitative evidence to support the inclusion of Aptitude P was not nearly as great as the evidence supporting Aptitudes S, K, F and M. Therefore, Aptitude P was omitted from the final test norms.

Cutting scores were set at five-point score levels close to one sigma below the mean of the combined sample which yielded optimum selective efficiency for the individual samples as well as for the combined sample. The cutting scores for Aptitudes S, K, and M were set at one standard deviation below the means and rounded to the nearest five-point score levels. This resulted in scores of 80, 75 and 85 for Aptitudes S, K and M, respectively. The minimum score for Aptitude F was set at one standard deviation below the mean and rounded to the lower adjacent five-point score level in order to decrease the proportion of the sample failing the norms. This resulted in a score of 75 for Aptitude F.

In order to compute the tetrachoric correlation coefficient and its standard error, and the Chi Square value for the Validation and Cross Validation samples, the criteria were dichotomized. The criterion of the Validation Sample was dichotomized by placing approximately one-third of the workers in the low criterion group. This resulted in the linear score of 43 as the criterion critical score. The criterion for the Cross Validation Sample was dichotomized by placing those workers who were in the lower half of all three criteria (supervisors ratings, average hourly earnings and production ratio earnings) into the low criterion group. Those workers who were in the upper half of any one of the three criteria were placed in the high criterion group. Workers in each low criterion group were designated as "poor workers" and those in each high criterion group were designated as "good workers."

Tables IV-A, IV-B and IV-C show the discriminative value of the norms, consisting of S-80, K-75, F-75 and M-85 and the dichotomized criteria for the Validation, Cross Validation and Combined Samples, respectively.

TABLE IV-A

Relationship Between Test Norms Consisting of Aptitudes S, K, F and M with Critical Scores of 80, 75, 75, and 85 Respectively and the Dichotomized Criterion for the Validation Sample

Furniture Upholsterer 780.381
N = 49

	Non-Qualifying Test Scores	Qualifying Test Scores	Total
Good Workers	6	26	32
Poor Workers	11	6	17
Total	17	32	49

r_{tet} = .68 X^2 = 8.420

$\sigma_{r_{tet}}$ = .24 P/2 $\angle$ .005

The data in the above table indicate a significant relationship between the norms and the criterion for the Validation Sample.

TABLE IV-B

Relationship Between Test Norms Consisting of Aptitudes S, K, F, and M with Critical Scores of 80, 75, 75, and 85, Respectively and the Criterion for the Cross Validation Sample

Furniture Upholsterer 780.381
N = 41

	Non-Qualifying Test Scores	Qualifying Test Scores	Total
Good Workers	8	20	28
Poor Workers	10	3	13
Total	18	23	41

r_{tet} = .69 X^2 = 6.579

$\sigma_{r_{tet}}$ = .26 P/2 $\angle$ .01

The data in the above table indicate a significant relationship between the norms and the criterion for the Cross Validation Sample.

TABLE IV-C

Relationship Between Test Norms Consisting of Aptitudes S, K, F, and M with Critical Scores of 80, 75, 75, and 85, Respectively and the Criterion for the Combined Sample

Furniture Upholsterer 780,381
N = 90

	Non-Qualifying Test Scores	Qualifying Test Scores	Total
Good Workers	14	46	60
Poor Workers	21	9	30
Total	35	55	90

r_{tet} = .67 X^2 = 16.416

$\sigma_{r_{tet}}$ = .17 P/2 $<$ .0005

The data in the above table indicate a high and significant relationship between the norms and the criterion for the Combined sample. The Chi Square test indicates that there are fewer than five chances in ten thousand that the obtained positive relationship between the test norms and the criterion occurred by chance.

VII. Conclusions

On the basis of mean scores, standard deviations, correlation coefficients, job analysis data and their combined predictive efficiency, it is recommended that Aptitudes S, K, F and M with minimum scores of 80, 75, 75, and 85, respectively be used as B-1002 norms for the occupation of Furniture Upholsterer. The equivalent B-1001 norms consist of S-85, T-70, F-80 and M-90.